

# New model navy: Turkey builds block by block

Turkey's Undersecretariat for Defence Industries is spearheading a long-term strategy to develop the country's domestic naval industrial capability. **Richard Scott** examines its plans to nurture both high-level shipbuilding and combat systems expertise

A milestone in the development of Turkey's indigenous capacity for the design, build and integration of naval vessels was marked on 9 April. On that day, P1200, the first of a new class of 56 m New Type Patrol Boat (NTPB) vessels for the Turkish Naval Forces Command, was launched from the Dearsan Shipyard in Tuzla, south of Istanbul.

Although the NTPB design is of modest size and complexity, the programme itself has a greater resonance on two counts: first, because it represents the first indigenously developed in-house naval design in Turkey in the modern era; second, it is the first time in the history of the modern republic that a naval vessel (excluding afloat support ships) has been built in a private shipyard for the Turkish navy.

Over the coming months, other local shipbuilding programmes will also start to bear

fruit; for example, RMK Marine will in early June launch the first of four 88 m search and rescue (SAR) ships for the Turkish Coast Guard; in August, ADIK is scheduled to launch the first of eight fast landing craft tank (LCT) vessels; and that same month TCG *Heybeliada*, the first of a new class of MILGEM corvette, is planned to start sea acceptance trials.

In parallel, the Ministry of National Defence's Undersecretariat for Defence Industries (SSM) is pushing ahead with follow-on programmes. It plans to let contracts for two new landing ship tank (LST) vessels, a submarine rescue mother ship (MOSHIP) and two rescue and towing ships by the end of the third quarter of 2010.

For the longer term, it has launched a competition for the acquisition of a large multipurpose landing platform dock (LPD) and is developing its procurement

strategy for the next-generation TF-2000 air-defence frigate.

What, however, is driving this impressive and ambitious programme? At its core, Turkey's maritime industrial strategy, as reflected in the SSM's defence industries sector strategy document for the period 2009-16, aims to nurture a capable, efficient and technologically proficient capability for the indigenous design and construction of naval ships engineered to meet the specific needs of the Turkish naval forces. It further foresees this capability being exercised for export work once its credibility has been established in its home market.

This is planned to be achieved, according to key objectives laid out in the strategy document, through the delivery of a series of policy initiatives: the organisation of both government and industry so as to create the appropriate environment for a sustainable sovereign capability; developing and 'up-skilling' an already established private-sector

commercial shipbuilding base; growing the design and 'intellectual' resource underpinning the sector; and broadening a suitably qualified domestic supply chain.

It is, to say the very least, a challenging endeavour given the multiple dynamics involved: the steep learning curve for local industry; the complexities of bringing together government entities and private business in a new enterprise model; getting the balance right between risk and performance; making fine case-by-case judgements on project procurement strategies; and taking difficult choices as regards those capabilities that should be sovereign, and those that may remain offshore.

## Changing the status quo

The last decade has witnessed the beginning of a transformation in Turkey's approach to the modernisation of its fleet and the attendant acquisition of new maritime platforms and associated systems. "After joining NATO, we initially relied on second-hand

New model navy: P1200, the first of 16 New Type Patrol Boat vessels, was launched at the Dearsan Shipyard in Tuzla on 9 April.



SSM: 1394195

ships from the US and Europe,” says Murad Bayar, SSM Undersecretary. “Later, we began production in-country at our naval shipyard facilities, using licensed designs [largely German in origin] and complete material packages including the steel, onboard equipment, command systems and weapons.

“Of course, while these programmes limited the extent of our contribution in design and materials, they provided good experience for our naval shipyards. We’ve been able to build support ships, corvettes, even frigates under this model.

“Typically, the first ship would be constructed abroad and the remaining ships would be built, using the supplied material package, design drawings and technical assistance, in the naval shipyards [at Gölçük and Istanbul]. That has resulted in an accumulation of naval shipbuilding experience primarily under the military.”

Today, Bayar is the figurehead for transformation across the Turkish defence industry and is leading change in the naval sector. “We have a strong heritage of shipbuilding going back to the days of the Ottoman Empire,” he says. “This has been continued in the modern republic, with a large aggregation of privately owned commercial shipbuilders in the Tuzla industrial area.” In fact, Turkey has risen to fourth (by tonnage output) in the world shipbuilding league behind China, South Korea and Japan.

“In parallel,” says Bayar, “we have built up a capability for naval construction in the state-owned naval shipyards. What we want to do now is to combine the respective experience and capabilities of these two sectors: the commercial know-how and efficiencies of the private yards; and the technical knowledge accrued in the naval shipyards.

“At the same time, we also want to build up our own capability to design naval ships, and assume responsibility for sourcing ship equipments from an increasing local supply chain. So our aim is to leverage the wealth of the national shipbuilding enterprise for the benefit of the navy. The challenge is to migrate naval shipbuilding activity into the private shipyards, while at the same time ensuring that we are also able to maintain and transfer the requisite specialist naval expertise.”

The SSM is looking for private shipyards to invest in the upgrade of facilities and skills so that they can take on naval work. “There are some significant differences between commercial and naval ships,” Bayar says. “Warships tend to be smaller and more complex, densely packed with systems and equipment. This makes both physical and functional integration much more complex and requires different skill sets. There are also more stringent security and quality assurance standards that must be met.

“But we think that experience in commercial shipbuilding offers a very good foundation to move into the construction of surface warships, and we are already seeing a positive response from several shipyards.”

The long-term development roadmap for the Turkish naval forces features a substantial naval construction programme over the next 10-15 years. Reflecting this, SSM’s maritime

industrial plan has sought to shape a sector that can deliver the forward programme while maintaining credible competition, explains Serdar Demirel, the undersecretariat’s department head for naval systems. “Com-

pared to the land, air and military electronics sectors, the naval sector development programme has started quite late,” Demirel says, “and we need to organise industry in a way so that it can meet the navy’s needs. Within



SSM: 1394196



SSM: 1394197

**ADIK is under contract to build a class of eight fast landing craft tank vessels (top). It is also SSM’s preferred supplier for two larger landing ship tank platforms (above).**



SSM: 1394200

**TCG *Heybellada*, the first MILGEM corvette, is planned to start sea acceptance trials in August. This vessel and second-of-class *Büyükada* are being built by Istanbul Naval Shipyard; production thereafter will transition to the private sector.**

## New Type Submarine Project builds up local content

While SSM is clear that Turkey will strive to build up its sovereign surface ship design and build capability, its aspirations regarding submarines are less ambitious. "The design and manufacture of submarines is an altogether more complex and specialised business," Undersecretary Murad Bayar says. "We have established the facilities and skills to construct submarines in Gölcük Naval Shipyard and at this stage do not envisage transitioning that unique expertise into commercial shipyards.

"So we will continue submarine construction at the [Gölcük] naval shipyard with overseas design assistance. Having built the Type 209 design with HDW [Howaldtswerke-Deutsche Werft], we are working with them again on the [New Type Submarine Project] to build six boats, from material packages, based on their air-independent propulsion Type 214 design."

However, at the same time, there is a determination to increase the amount of local content and systems technology embodied in the new design. "We are taking steps with the new submarines to increase the number of locally developed subsystems," points out Bayar. "For example, Aselsan is providing the ESM system, MilSoft the datalink processor and Ayesa the consoles.

"In addition, Havelsan will take responsibility as software maintainer for the ISUS 90 command-and-weapon control system. That will give us a sovereign capability for software upkeep and adaptation."

STM is also taking an active role in the New Type Submarine Project as it looks to grow its intellectual capability and technical knowledge. Its role encompasses participation in design activities, engineering changes on drawings, system integration activities, and increasing the contribution of the local supply chain through the indigenous supply of 18,000 separate items of materials. STM will also undertake development of shipyard and battery plant infrastructure, perform the procurement of materials and services, and supply integrated logistic support documentation and services.



Under the New Type Submarine Project six boats, based on the HDW Type 214 AIP design, will be built at Gölcük Naval Shipyard. These will incorporate a significant amount of local content.

the Naval Systems department we have more than 30 separate programmes administered through four separate project groups responsible for major warships, boats, amphibious ships and auxiliary ships.

"What we have derived from this is a requirement for up to seven surface ship yards, specialising in different segments of the market, to meet requirements for capacity and competition. This specifically excludes submarines, which we will continue to assemble at Gölcük Naval Shipyard."

SSM's strategy sees a requirement for two companies specialising in fast boats built from composite or aluminium. "We already have a proven composite capability with Yonca-Onuk," says Demirel. "What we would like is a second yard in this niche to offer competition." Turning to construction

**A view of P1200 a few days after launch. The NTPB programme is symbolic of change in Turkey's naval industry, being the first indigenously developed in-house naval design. It also marks the first occasion in the history of the modern republic that a naval vessel (excluding afloat support ships) has been built in a private shipyard for the Turkish navy.**



in steel, a requirement has been identified for two yards to compete for the design and build of smaller ships. "We see relatively large production volumes in this area," says Demirel, "and that requires a capability for efficient steel cutting, manufacture and outfitting.

"Then we have a need for two more yards more suited to building larger, more complex warships, right up to large amphibious ships. And finally, we have identified a role for a fifth steel shipyard that could compete across both these high-volume [small ship] and high-capacity [large ship] segments.

He adds: "For volume contracts, we may look to offer second-source build, but that would require the follow-on yard to meet the same commercial conditions as the lead shipbuilder."

To meet the steel shipbuilding requirement, SSM has identified seven candidate yards – ADIK, Çelik Tekne, Dearsan, Desan, Istanbul Denizcilik, RMK Marine and SEDEF – that it believes have the credibility to meet naval construction requirements. Demirel observes: "We've undertaken a series of site inspections to examine capability and capacity, scrutinise process and governance, and evaluate operational issues such as quality assurance, site security and health and safety."

He continues: "From this process, we have prequalified the seven designated yards. Of these, four have already received contracts from us: RMK is building the new SAR ships for the Coast Guard; ADIK is under contract for the construction of eight fast LCT vessels and is our preferred supplier for the construction of two larger LSTs; Dearsan is prime contractor for the NTPB programme; and Istanbul Shipyard has performed the modernisation of the Coast Guard's four SAR 35 patrol craft."

Whether the future programme can sus-

tain five yards keen for naval work remains to be seen, Bayar admits. "In the current phase we want to see [which yards] will come to the fore," he says. "What's more, we want to see shipyards develop their naval capability alongside their commercial shipbuilding activities. This should not be seen as a stopgap to tide the yards over while demand is low in the mercantile market."

He continues: "Military shipbuilding requires a certain level of investment to achieve the necessary certifications and quality assurance standards, but if you make that investment, you want to be sure that there will be work going forward to justify the outlay. If you distribute the work too much, then you won't be able to support all of those yards."

"What I want to see is a set of shipyards with the right capabilities and with good prospects for follow-on business. At the same time, we want to maintain a certain level of competition where it is sensible to do so."

"It is quite possible that over time the number of [naval] qualified yards may reduce, and we may ultimately see greater specialisation. However, I think our intention to sustain capacity and competition is likely to see at least three or four yards pursuing naval orders 10 years from now."

## Crawl, walk, run

Getting the shipyards to adapt their process, develop their infrastructure and hone their skill sets to tackle increasingly complex naval programmes of course represents a significant challenge. "The commercial yards have developed and demonstrated their proficiency in mercantile construction," observes Demirel, "but military shipbuilding is something very different in terms of qualifications, skills, certification, oversight and documentation."

"So there is a learning process. We are trying to accelerate this by pulling through the considerable construction expertise accrued by Istanbul Naval Shipyard in the construction of complex surface ships. We are also seeing experienced former naval officers being recruited by the shipyards to bring the benefit of their expertise and help the commercial yards understand the military business culture. Their project-management skills are particularly important here."

Building up the indigenous design and intellectual resource is equally important. "We recognise the need to bring on our local design capability, and we are doing this in a staged manner," points out Bayar.

"In the current phase, we are focused on relatively small and simple vessels, such as patrol craft, offshore patrol vessels and landing craft."

"In the next epoch, we are looking to move to more complex ships. The LST programme now in negotiation [with ADIK] is an example, with the LPD to follow."

Bayar does not rule out a continued role for foreign shipyards and design houses in certain situations. "For example, the LPD project requires a complex and unique ship, and does not lend itself to the local development of a new design at acceptable time, cost

and risk. So in this case we're pursuing a procurement strategy that allows local yards – as primes – to bid in conjunction with international partners."

"Beyond that, we are now at an early stage of thinking as regards the TF-2000 air-defence frigate. This will be an extremely complex and capable ship, and we have not yet determined whether this will be a locally developed design, or whether we might consider a MOTS [military off-the-shelf] solution."

"I think that our experience from MILGEM will be important in how we will formulate the acquisition strategy for the new [TF 2000] frigate. Right now, the thinking is towards a similar mixed model. That would mean building the first frigate in a naval ship-

yard with the assistance of the commercial sector in design, materials and equipment. Follow-on units would then be built in a private yard."

Developing a strong local supply base at Tier 1, Tier 2 and below is another major objective. "The most important catalyst to improvement in the supply chain is the MILGEM project," adds Demirel, "with local industry taking responsibility for much of the material, equipment and services supplied to SSM."

"The task here is to encourage manufacturers to enter the military market given that they already make money from volume production in the commercial sector. We are asking them to produce in much lower volumes,



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to much more stringent standards, and with much higher levels of documentation. So we have to convince them that being a military supplier is a good thing.”

Also just as industry must develop, so SSM acknowledges the need for the government side to develop its skills and organisation to function as an ‘intelligent customer’. “We need to be a smart customer and a smart project manager,” says Bayar. “To

achieve this we have undertaken an internal reorganisation within SSM that is designed to embody lessons learned and optimise the organisation’s structure.

“This is also intended to improve the way we work with STM [Savunma Teknolojileri Mühendislik] as our chosen authority for impartial technical and procurement advice. They have a deep technical expertise that we need to make best use of. Also, I don’t rule

out engagement with other technical companies elsewhere in Europe that could provide specialist expertise to complement that provided by STM.”

Demirel adds: “We [SSM] are an acquisition organisation with some technical capability. For higher-level advice, we have a contract with STM for technical advice and systems engineering services. In addition, we are getting good support from the navy, particularly when it comes to tender evaluations “At this relatively early stage, the key thing is to ensure we capture the lessons learned and build up a database that means we continue to make the naval procurement process more efficient and effective.”

Following a five-way competition, Dearsan Shipyard was contracted by SSM in August 2007 as lead contractor for the 16-ship NTPB programme.

Its experience since then reflects the challenges faced by a commercial yard moving into the naval marketplace, explains company board member Güney Koray Gökbayrak.

## Adapting skills

“We had built up good experience in the construction of tugs, dredgers and small chemical tankers, but have had to adapt our skills markedly to build naval vessels,” he says. “Standards and quality assurance are very different ... the navy is a much more demanding customer. Training and maintenance documentation presents a huge task, as do test, trials and commissioning. And there is also a much more onerous oversight regime, and the need for secret facility security clearance.

“The problem we faced, of course, was that there was no accumulation of corporate knowledge. So we have worked closely with the SSM and the navy to raise our game, and combined the skills of our own shipyard staff with the experience brought in by retired naval officers.”

Dearsan has made a significant investment in upgrading its facilities, including a new office building, storage area workshops, steel cutting machine, module hall and assembly shed. At the same time, it has introduced new training regimes and working practices to improve productivity and health and safety on the shopfloor. It has also assembled a competency in combat systems integration.

Yet Gökbayrak acknowledges that, despite careful planning, the first NTPB of class “has been a steep learning curve [but] we now have five more of the class in various stages of build and plan to ramp up to delivery ‘drumbeat’ of one vessel every three months, possibly quicker. We’re confident that shopfloor experience and the efficiencies of volume production will enable us to recover the increased man hours incurred at the start of the project.

“The scale of effort required to deliver has required considerable investment from us,” he adds. “You can’t dabble in the naval business, you have to be 100 per cent committed or not at all.

“Our aim is two-pronged. First, to deliver

## MILGEM provides a catalyst for local industry growth

The launch on 27 September 2008 of TCG *Heybeliada*, the first of a new class of MILGEM (an abbreviation of Milli Gemi or National Ship) corvette, marked a very public milestone in Turkey’s efforts to grow its capability in the design, build and integration of naval vessels. Due to enter service in 2011, *Heybeliada* is the first of a planned class of up to 12 ships; the keel of the second ship of the class, *Büyükada*, was laid down at Istanbul Naval Shipyard on the same day as *Heybeliada*’s launch.

Aside from being a central component in the recapitalisation of the Turkish naval forces, the MILGEM programme is also seen as a key pole in the development of a sovereign maritime military-industrial capability. Indeed, MILGEM has for the first time seen the indigenous enterprise take responsibility for the whole-ship procurement and integration of a complex warship, providing a stern test for Turkey’s emerging naval industrial base.

Undersecretary Bayar describes MILGEM as “our highest priority programme”, adding: “It’s a very ambitious project, because it requires us to deliver an advanced patrol and anti-submarine warfare ship based on local capabilities to the maximum extent”.

MILGEM is characterised by the SSM as adopting a mixed model. “We are utilising the [Istanbul] Naval Shipyard for the initial build programme to capitalise on their existing warship building experience, but design services have been contracting out to industry,” says Bayar. “Within the current MILGEM Prototype Ship Program we signed a contract with STM for co-ordinating the shipbuilding activities in Istanbul Naval Shipyard. These activities include responsibility for design services and platform systems and materials acquisition.”

At 99 m long and displacing about 2,000 tons, MILGEM is intended to meet the needs of the Turkish naval forces for an offshore patrol combatant able to perform patrol, surveillance, interdiction and anti-submarine warfare missions. The programme is being managed by SSM and the Turkish naval forces through a joint project office, with additional participation from Istanbul Technical University (hydrodynamics), Turkish Lloyd (as classification society), TUBITAK (research and development support), MTU-Turkey (main propulsion system), STM (responsible for the acquisition of ship design services and platform systems) and a partnership of Aselsan and Havelsan (jointly responsible for combat system design, development and integration).

“We will take *Heybeliada* to sea for constructor’s trials later this year,” says Bayar, “with delivery to the Turkish Naval Forces Command scheduled for mid-2011. *Büyükada* will follow in 2013. From ship three onwards, construction activities will be transferred to the private sector.

“By early next year, with first-of-class trials performed, we should be in a position to confirm the design and then freeze the drawing/design data pack for issue to industry. We need to do this in order to maintain the continuity of production after the second unit. In fact, building the second unit in the Naval Shipyard has enabled us to mature the design from the ‘prototype’. It also wins us the time to go out to industry with a proven design and a fixed material package.”

TCG *Heybeliada* was launched in September 2008. The MILGEM project is a lynchpin in the development of Turkey’s indigenous naval industrial capability.



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a successful design that meets the needs of our navy. Second, to market this design and similar variants overseas.

“At the same time, we want to remain competitive in the commercial sector. So while we have all departments under the same roof, there is a clear dividing line between military and commercial activities – that means separate groups for planning, materiel procurement and manufacture to prevent ‘cross-contamination’.”

Going forward, Dearsan is currently bidding to build a submarine rescue MOSHIP and rescue and towing ships. “Beyond that, we will take a view on a case-by-case basis,” says Gökbayrak. “For example, the yard has the capacity to build a MILGEM-size vessel under cover, but we will need to look carefully at capacity in the yard at any given point in time. Our size will determine what projects we bid.”

Just a few blocks away from Dearsan, the Tuzla shipyard of RMK Marine, part of the Koç group, is working towards the launch of the first of four SAR ships for the Turkish Coast Guard. In this case the design has come from overseas – being based on Fincantieri’s Sirio-class offshore patrol vessel – but RMK Marine is building all four in country with a high local content in terms of systems and equipment.

“We have maintained a strong interest in the naval construction programme since SSM first announced its plans to open up to the private sector,” says Kudret Onen, presi-



SSM: 1394199

**RMK Marine, part of the Koç group, is under contract to build four 88 m SAR vessels for the Turkish Coast Guard. The design is based on Fincantieri’s Sirio-class offshore patrol vessel, with the lead ship planned for launch in early June.**

dent of Koç’s defence business group. “The Coast Guard SAR ship programme is very much in the vanguard of this process of transformation.

“It’s a huge transformation for Turkish shipyards coming from a commercial background,” he adds, “but RMK Marine has two advantages. First, the Koç group already had an established relationship with SSM in the defence automotive sector, which has given the group a very clear understanding

of the requirements placed on us in the defence market.

“Second, alongside commercial shipbuilding, RMK has built up a successful super-yacht business. That is another very demanding market, where customers demand superior quality and very high levels of integration. That led the company to invest in developing its own facilities, production engineering resource and whole-ship integration skills as a turnkey contractor.” The

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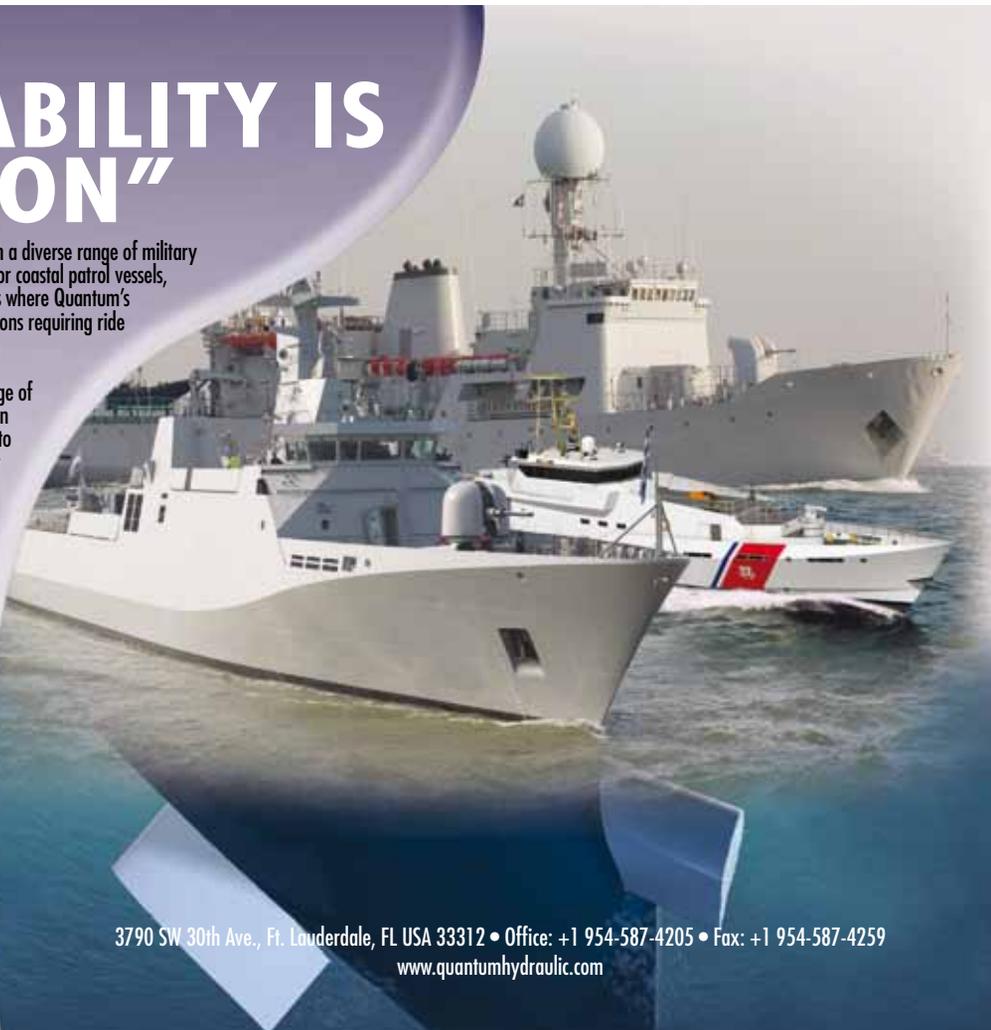
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**Yonca-Onuk has established itself as a leading constructor of composite-hulled fast patrol craft (its MRTP20 fast interceptor is shown here in service with the Turkish Coast Guard). It has also captured export sales in Malaysia, Pakistan and the United Arab Emirates.**

Coast Guard SAR ship programme – which will see four ships delivered between mid-2011 and the end of 2012 – has enabled RMK Marine to build up its naval capability. “It has given us the insight into the increased complexity of naval vessels,” says Onen, “and allowed us to factor the true costs associated with naval build standards.

“We’re looking strategically and see this as just the start. Naval shipbuilding is a central part of our business plan going forward.

“It’s always been in our mind [since Koç acquired the yard] to build the MILGEM corvette in our yard. We’re also developing our [bid] strategy for the LPD programme.

“One issue we are considering is yard capacity if the two were running in parallel ... that would require investment in a dry dock. We would also look to move super-yacht production out of the yard, and instead dedicate those facilities for naval work.

“Further ahead, we would then see



Yonca-Onuk: 1333762

TF-2000 sustaining business into the next decade. It is still early days on the frigate, but RMK is very much looking to support this project,” says Onen.

While domestic requirements are driving SSM’s maritime industrial strategy, there is a clear intention to establish, in parallel,

Turkey’s emergent naval shipbuilders as credible competitors in the export market, with a particular focus on the Persian Gulf, south and southeast Asia, and the Black Sea region.

Bayar observes: “The quality and performance of the ships delivered to the [Turkish] navy will be a reference card for overseas customers, but I think that some of the designs we are now building our likely to have wide appeal.

“The New Type Patrol Boat, for example, represents a cost-effective answer to today’s maritime security needs. We are also in discussion with Pakistan over the possible adaptation of MILGEM to meet the Pakistan Navy’s future corvette requirement.”

## Capturing export orders

Composite boat builder Yonca-Onuk is very much leading the way. Having supplied fast craft for the Turkish Coast Guard, it has gone on to capture export orders from Georgia, Malaysia, Pakistan and the United Arab Emirates (UAE).

It has also established a joint venture in Malaysia with Boustead Heavy Industries and is providing technology transfer to Abu Dhabi Ship Building for licensed production in the UAE.

“Yonca-Onuk has come up with a superb product line that is absolutely relevant to customer needs,” Bayar says. “Their technology is world leading.”

He adds: “I think we have some competitive advantages in the market [but] the next 12 months will provide a clearer indication of sector strategy progress. By mid-2011 we should have a good idea of how we are performing – MILGEM will be at sea, and we will have the first examples of the new patrol boat, SAR ship and landing craft tank in the water. It will be a milestone year.”

## Building an indigenous combat systems capability

In parallel with its efforts to nurture indigenous naval ship design and construction activities, SSM is also working to develop a local capability for the supply, engineering and integration of shipborne combat systems. In this sector, two Turkish Armed Forces Foundation companies, Aselsan and Havelsan, are taking a leading role. At the same time, opportunities are emerging for small and medium-size enterprises (SMEs) in the private sector.

“We see the two foundation companies as our lead systems integrators and core combat system suppliers,” says SSM’s Murad Bayar. “Aselsan brings skills in command and control, weapon control, electronic warfare, radar, electro-optical systems, communications and acoustics, while Havelsan has built up its software and systems expertise in naval combat management systems.”

The two companies are working together to integrate the combat system for the MILGEM corvette programme. Aselsan is also leading combat system integration activities for the Coast Guard SAR ship, and is subcontractor to Havelsan for the mini-combat system being fitted in the Dearsan-built New Type Patrol Boat.

For its part, Havelsan has also ‘productionised’ the GENESIS (Gemi Integre Savas Idare Sistemi) combat management system (CMS) being retrofitted in the Turkish naval forces’ eight FFG-7 frigates under the G-Class Frigate CMS Modernization Programme (G-GCMP). GENESIS, which has its origins within the navy’s own Software Development Centre, has been taken forward by Havelsan, under the sponsorship of the navy and the SSM, as a ‘common core’ architecture to meet a range of ship and shore-based requirements; other variants are being developed for the MILGEM corvette project and land-based command centres, and it is expected that GENESIS evolutions will also feature on board the new LPD and TF-2000 frigates.

However, Bayar is adamant that there is an opportunity for SMEs to bring their products and skills to the table. “What we are trying to do is create a playing field below the systems integrators where private companies can find a niche,” he says. “Our advice to them is to find a niche in which they excel.

“At the same time, we are asking Aselsan and Havelsan to ensure that they provide opportunities to SMEs as part of our strategy to encourage the development of the supply chain.”

Turkey is developing an indigenous competency in combat systems engineering and integration. Havelsan is taking responsibility for the upgrade of the eight G-class frigates with the Genesis combat-management system.



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